

# Virginia Water Resources Workshop



## How Can Conservation And Innovation Help Your Plan?

*Presented by:*

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# Virginia Water Resources Workshop

## **PART I**

### **The Basics of Conservation and Innovation**

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## What are the Benefits of Building Conservation and Innovation into Your Water Supply Plan?

- Time is money, and plans that have seriously considered conservation and innovation can reduce the time needed to secure project approval
- Alternatives based on conservation and innovation can cost less gallon-for-gallon than traditional water supply sources



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- Conservation and innovation can extend the life of existing water supplies
- Can be used to increase wastewater capacity under new Chesapeake Bay nutrient caps
- Opportunity to generate nutrient credits and offsets under Chesapeake Bay nutrient caps
- Can be a source of grant funding
- Overall, provides for more sustainable long-term water supply

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## Examples of Effective Conservation and Innovation Measures

- Conservation – More Than Drought Management
  - Improved metering
  - Indoor conservation
  - Maintenance to minimize leakage
  - Conservation pricing
  - Conservation landscaping
  - Public education and outreach
  - Smart growth





## Examples of Effective Conservation and Innovation Measures

- Innovation
  - Recycle
  - Reuse
  - Water banking
  - Desalination
  - Groundwater replenishment



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## Water Supply Innovation – Suggested Sources for Further Reading

- Water Reuse/Recycling/Reclamation/Groundwater Replenishment:
  - <http://www.denverwater.org/> (click on “Recycled Water”)
  - <http://www.waterrecycling.com/>
  - [http://www.ocwd.com/\\_html/wf21.htm](http://www.ocwd.com/_html/wf21.htm)
  - <http://www.irwd.com/> (click on “Reclamation”)
  - [http://www.rinconwater.org/recycled\\_water.htm](http://www.rinconwater.org/recycled_water.htm)
  - <http://www.sloreuse.org>
  - <http://www.dep.state.fl.us/water/reuse/project.htm>
  - <http://www.hbws.org/cssweb/display.cfm?sid=1103>
  - <http://www.news.com.au/story/print/0,10119,12858651,00.html>
  - <http://www.gsenet.org/library/11gsn/2005/gs050202.php#N.J.%20to%20Give%20Its%20Treated%20Wastewater%20a%202nd%20Chance>
  - <http://www.gwrsystem.com/>



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- Water Reuse/Recycling/Reclamation/Groundwater Replenishment:
  - [http://www.olivenhain.com/recycled\\_water.html](http://www.olivenhain.com/recycled_water.html)
  - <http://www.city.palo-alto.ca.us/waterreuse/>
  - <http://www.ieua.org/> (click on “Recycled Water”)
  - <http://www.hrsd.state.va.us/waterreuse.htm>
  - <http://www.dnr.metrokc.gov/wtd/reuse/>
  - <http://www.dep.state.fl.us/water/reuse/flprog.htm>
  - <http://www.napa.ufl.edu/2004news/desal.htm>
  - <http://www.ci.carlsbad.ca.us/water/wdrecycle.html>
  - [http://www.usmayors.org/uscm/us\\_mayor\\_newspaper/documents/04\\_12\\_04/water\\_reuse.asp](http://www.usmayors.org/uscm/us_mayor_newspaper/documents/04_12_04/water_reuse.asp)
  - <http://www.sandiego.gov/water/waterreusestudy/links/index.shtml>





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## Water Supply Innovation – Suggested Sources for Further Reading

- Water Desalination:
  - <http://www.hbws.org/cssweb/display.cfm?sid=1105>
  - [http://www.signonsandiego.com/uniontrib/20050618/news\\_6m18desal.html](http://www.signonsandiego.com/uniontrib/20050618/news_6m18desal.html)
  - <http://www.capemay.com/capemayarchives/Desalination.html>
  - <http://www.memagazine.org/backissues/oct04/features/fromsea/fromsea.html>
  - <http://www.waterindustry.org/Water-Facts/de-sal-4.htm>
  - <http://www.heartland.org/Article.cfm?artId=11593>
  - <http://www.hbfreshwater.com/articles/05/020605.asp>
  - <http://www.ionics.com/applications/brackishwater/index.htm>
  - <http://www.vwrrc.vt.edu/publications/recent.htm> (click on “SR 25-2004 The Feasibility of Using Desalination To Supplement Drinking Water Supplies in Eastern Virginia” [PDF])
  - [http://www.sptimes.com/2004/08/07/Tampabay/Cost\\_to\\_fix\\_desalination.shtml](http://www.sptimes.com/2004/08/07/Tampabay/Cost_to_fix_desalination.shtml)



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- Water Desalination:
  - <http://www.cctexas.com/?fuseaction=main.view&page=1791>
  - [http://www.watercorporation.com.au/water/water\\_sources\\_desalination\\_articles.cfm](http://www.watercorporation.com.au/water/water_sources_desalination_articles.cfm)
  - <http://www.carlsbad.desal.com>
  - <http://www.elpasotimes.com/apps/pbcs.dll/article?AID=/20050522/NEWS/505220337/1001>
  - <http://www.uswaternews.com/archives/arcquality/3despla8.html>
  - [http://www.observernews.net/artman/publish/article\\_900.shtml](http://www.observernews.net/artman/publish/article_900.shtml)
  - <http://www.uswaternews.com/archives/arcquality/3tambay4.html>
  - <http://www.csc.noaa.gov/magazine/2003/03/florida.html>
  - [http://www.santabarbaraca.gov/cgi-bin/MsmGo.exe?grab\\_id=244&page\\_id=5965824&query=desalination&SCOPE=All&hiword=DESALINATED+desalination](http://www.santabarbaraca.gov/cgi-bin/MsmGo.exe?grab_id=244&page_id=5965824&query=desalination&SCOPE=All&hiword=DESALINATED+desalination)



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## **PART 2**

### **Water & Wastewater Initiatives Insights from LCSA**

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## Preview for Next 20 Minutes

- Quick Facts
- Initiatives
  - Water Reuse
  - Water Banking
  - Nutrient Management
- Some Thoughts to Take Home



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## Quick Facts

- Loudoun County 517 sq. mi. & 247,000 people
- One of the fastest growing areas in VA & USA
- Customer base doubles about every 8 years
- Constructing 10-mgd membrane wastewater plant
- Continuous planning for water & wastewater systems





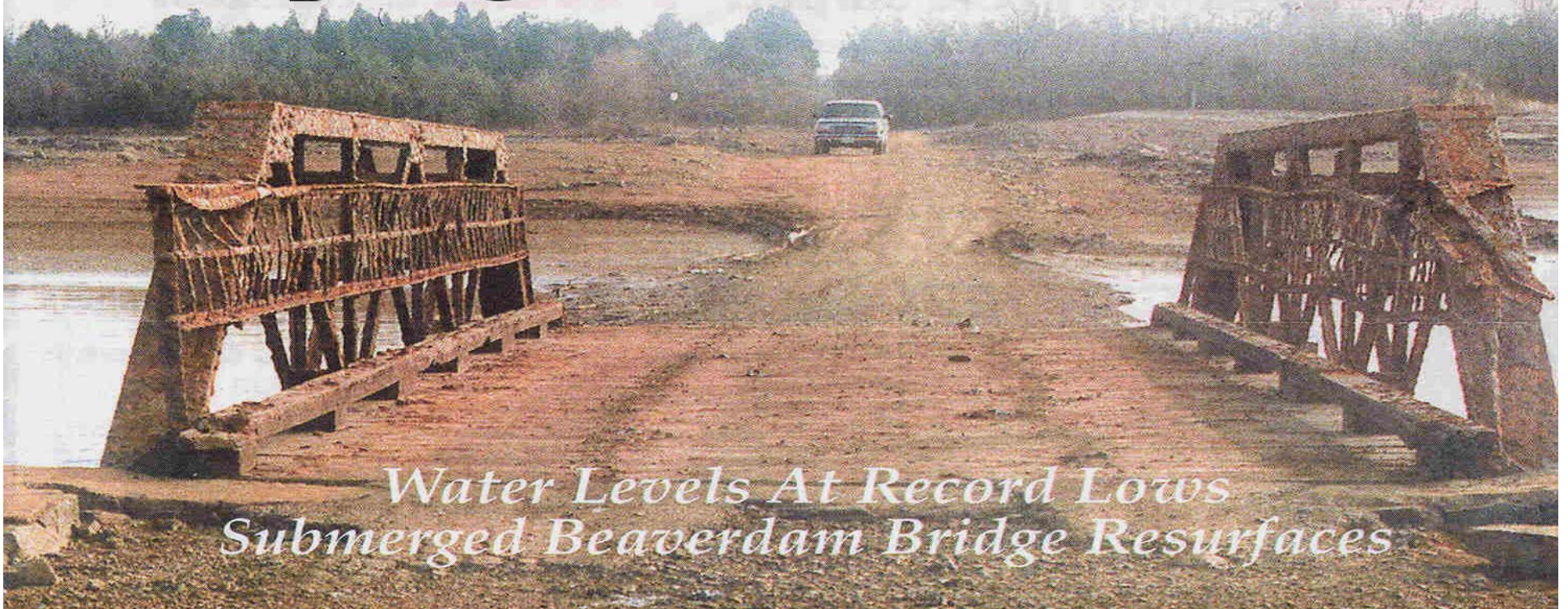
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December 9, 1998

[www.leesburg2day.com](http://www.leesburg2day.com)

Public Notices Pages 35, 36 & 37

## Drought Update: County Urges Water Restrictions



*Water Levels At Record Lows  
Submerged Beaverdam Bridge Resurfaces*





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## Water Reuse





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## What is Water Reuse?

- Reclaiming water from treatment of wastewater
- Planned (not planned)
- In accordance with state and local regulatory requirements – direct beneficial use
- Non-potable reuse is widely accepted practice
- Examples: irrigation (golf courses & landscaping), flushing water, chiller make-up, industrial applications



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## Water Reuse as a Tool

- Conserves water resources
- Saves higher quality water for potable system
- Gets more supply out of current water supply & postpones construction
- Reduces effluent discharge to surface waters



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## LCSA's Water Reuse Initiative

- Currently reuse effluent from small community wastewater treatment plant for irrigation
- Planning to reuse effluent from Broad Run WRF
  - initial 10 sq. mi service area
  - golf courses, landscaping areas at office parks
- Ideal plan: use reclaimed water from April to October to offset annual increase in wastewater flow generated by new growth
- Looking at other ways to incorporate water reuse into water management plan





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## Water Banking



## What is Water Banking?

- Initiative for sustainable water supply
- Long-term plan for providing sufficient raw water storage for future droughts
- Pumping water from river during normal flows
- Storing water in rock quarries
- Concept: make a water “deposit” when times are good – make a water “withdrawal” when needed during a drought or an emergency situation





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## Water Bank Initiative

- 5 yr. effort, lessons learned by 1998 drought
  - Long term (50 yr.) need for raw water storage
- 3 privately owned quarries in central Loudoun
  - All in active operation and deep
  - Diabase rock (fine grain, high density)
- 9 technical memorandums completed, starting 2 more
- LCSA provided comments to DEQ during regulation development



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## Water Banking as a Tool

- Creates a significant water resource in Loudoun with minimal environmental issues
- In alignment with other potential uses - water reuse and nutrient management initiatives
- Useful for water supply planning and drought response
- Promotes regional cooperation and discussion with stakeholders



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## Economic Incentive

- 1988 Study for a new water reservoir
  - 1,700 acre impoundment, 80 ft. dam: \$81M
- Quarry A (mid-range water pool elevation option)
  - 1.62 BG (20 acre surface area)
  - \$49 to \$54 million
- Quarry C (mid-range water pool elevation option)
  - 4.32 BG (55 acre site)
  - \$41 to \$48 million







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## Nutrient Management





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## Nutrient Management Initiative

- LCSA is looking at several innovated ways to reduce its nutrient waste load
  - Discharge from Broad Run WRF
- Driven by regulatory initiative for Chesapeake Bay compliance
  - Water Quality Management Planning Regulation
- Opportunity to align nutrient offset provisions with water management strategy

## Approaches for Nutrient Management

- LCSA has asked DEQ consider “netting out” the background nitrogen and phosphorus in its raw water supply from its nutrient waste load allocation
- Receive credits for nutrients in the effluent used in the LCSA Water Reuse Program
- Withdraw stormwater from a stream and store it in a Water Bank (receive nutrient credits)
- Require new development to install non-point source BMPs which are above and beyond that required





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## Some Thoughts to Take Home

From LCSA viewpoint, new opportunity for:

- Innovation
  - Look beyond traditional approaches
  - Study new alternatives
  - Consider less environmentally challenging options
- Applying Lessons Learned
  - Past decade of droughts & water restrictions
  - Helpful hints and insights from others
- Increasing Regional Planning & Cooperation
  - Stakeholder involvement
  - Partnership with state, local and regional interests
  - Minimize permitting issues

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